Group for Earth Observation

When was GEO formed?

GEO was formed in the UK during November 2003

GEO's Aims and Objectives

- to promote live reception of weather satellites for ***amateur*** and ***educational*** users
- to ***represent the interests*** of the above users with appropriate national and international ***agencies***
- to promote ***self-education*** in satellite reception and imaging in the amateur and educational sectors
- to publish an informative, quarterly ***colour magazine***, devoted to Earth imaging and weather satellites

GEO

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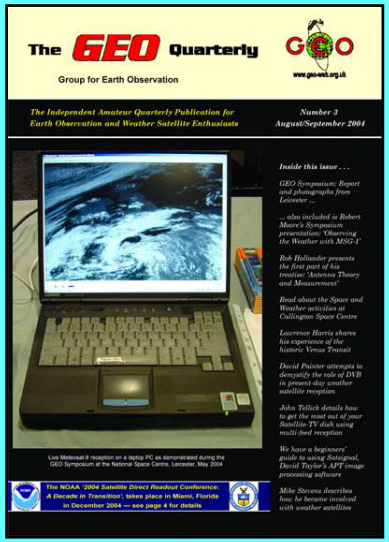
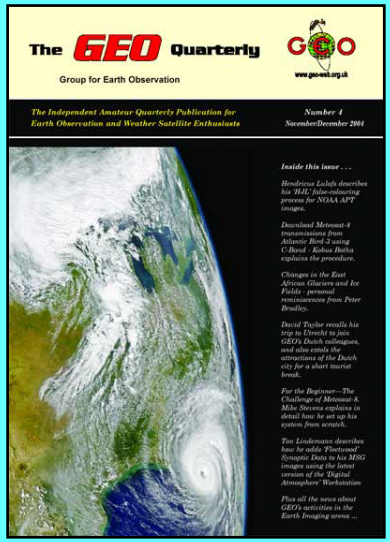
GEO Quarterly

Launch issue
March 2004

Quarterly No 2
May 2004



Quarterly No 3
August 2004



Quarterly No 4
November 2004

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NASA's Terra satellite acquired what is believed to be the first ever direct observation of a cyclone in the South Atlantic Ocean on March 26, 2004. This Moderate Resolution Imaging Spectroradiometer (MODIS) image shows the storm off southeast Brazil.

A blue halo of phytoplankton curls around the Falkland Islands in this amazing true-color Aqua MODIS image from January 26, 2004.

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www.geo-web.org.uk

Welcome to the second issue of the *GEO Quarterly*. Our thanks to all of you who applied for a copy of our Launch Issue earlier this year, and specially to everyone who contacted us with supportive comments.

By the time you read this, the first *GEO* Symposium will have taken place at the National Space Centre in Leicester. Look up the *GEO* website (http://www.geo-web.org.uk) to view photographs taken on the day. A full illustrated report on the Symposium will be published in *GEO Q2*.

This quarter, we have several interesting contributions from overseas readers. Bill Johnston explains how to compile a Radio Horizon Table to help make the most of those low elevation satellite passes; Fred van der Bosch details an improved technique for integrating satellite images into Digital Atmosphere; John Coppens describes how *Linux* users can decode NOAA APT using *WxtoImg* while Arne van Belle extols the virtues of satellite-TV coaxial cable.

There are also regular submissions from stalwarts Francis Bell, who has some controversial ideas on global warming and climate change, and Peter Wakelin, who continues on the theme of the Indian Space Programme.

We do hope there is something to everyone's taste in this issue—now turn the page and *enjoy* your copy of *GEO Q2*.

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GEO is led by

Francis Bell, Clive Finnis, Les Hamilton, Peter Wakelin, Nigel Evans, Ray Godden, John Tellick

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Responsibility for Constructional Projects and Software

Every effort is made to ensure that the technical and constructional articles published in this Quarterly are correct. However, the ultimate responsibility is with the reader to ensure the safety of constructions and for any interfacing with other equipment. GEO cannot accept liability for shortcomings in any published design or any constructions carried out by members or other third parties.

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What's in the GEO Quarterly?

- Guides to setting up hardware and software
- Imaging software reviews and 'how-to' guides
- Reports from meetings and conferences
- Satellite images - many in colour
- The latest Earth-imaging news
- Articles and images describing weather phenomena

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Using Wxtoimg Images in Digital Atmosphere

Fred van den Bosch - fred@vandenbosch.speedling.nl

In December 2003, I posed the question as to whether there was a more intelligent way to use pictures from *WXtoImg* in *Digital Atmosphere*. Then I had some e-mail discussions with Ton Lindemann of *Meteo Maarssen*. His website (in Dutch) is worth a visit.

www.meteo-maarssen.8m.com

This further instalment has been developed on the basis of these contacts. It is still a trial-and-error story, but now in a structured way. New maps can be developed very quickly, especially after you have gained initial experience with my techniques.

Setting up WXtoImg

Open <Options> on the *WXtoImg* menu-bar, and click on <Projection Options...> to display the *Projection Options* input screen (figure 1). Here you must input values for the latitude, longitude, north, south, west and east boundaries, and scale—choose values that will give the image area you want. Additionally, in the <Options> menu, uncheck 'disable map overlay'—this method will not work correctly if the overlay is absent. Finally, move to the <Projection> menu and select 'Orthographic'.

Now you are ready to generate your satellite image. Do so, and write down its width and height in pixels (this will appear on the status line at the bottom of the screen, just before the image is displayed). Finally, choose <Image/Write background> and save the image as a BMP file (the image format **must** be BMP for later importing into *Digital Atmosphere*).

Figure 1
The WXtoImg parameter screen

Setting up Digital Atmosphere

Open <Map/Generate map-->Enter lat/lon> and use the horizontal and input exactly the same longitude and latitude values you used in *WXtoImg*. Next, enter the width and height values you wrote down earlier into their respective fields (figure 2) then click 'OK' to generate a map.

You will now have to resort to a little trial and error to select a scale that generates more or less the same size of map as the *WXtoImg* image—precision is not so important at this moment. Once you have generated a map that looks ok, save it with <Map/Save map> as a BMP.

Figure 2
The Digital Atmosphere parameter screen

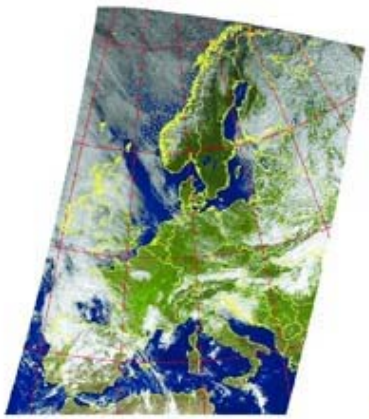

Figure 5
A WXtoImg orthographic image, is created, complete with country outlines (12:18 UT pass from October 12, 2003).

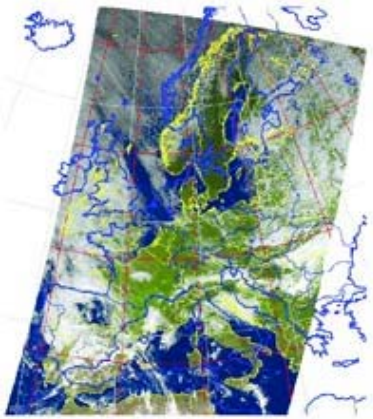

Figure 6
First attempt loading the image into Digital Atmosphere. Registration between image and map is poor.

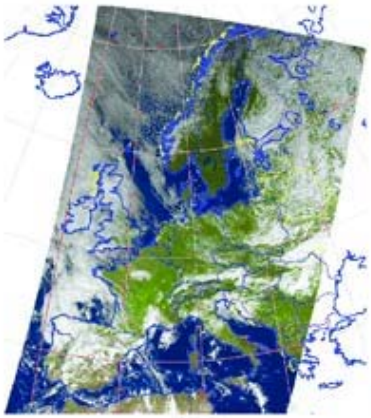

Figure 7
Following fine tuning, as explained on the opposite page, the image and map now show excellent registration.

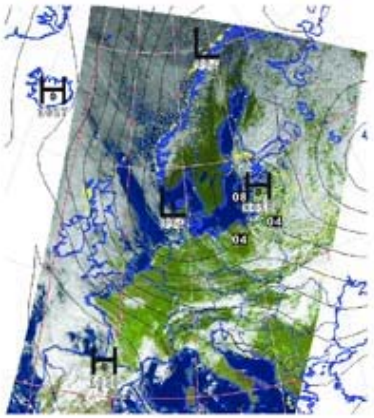

Figure 8
The WXtoImg image loaded into Digital Atmosphere, with added synoptic sea-level pressure overlay.

Who Manages GEO?

GEO is currently managed by a team of seven

Francis Bell	-	Publicity and Education
Nigel Evans	-	Membership Secretary
Peter Wakelin	-	Meteorological Guru
John Tellick	-	Liaison with Agencies
Ray Godden	-	Webmaster
Clive Finnis	-	Electronics consultant
Les Hamilton	-	Editor: GEO Quarterly Magazine

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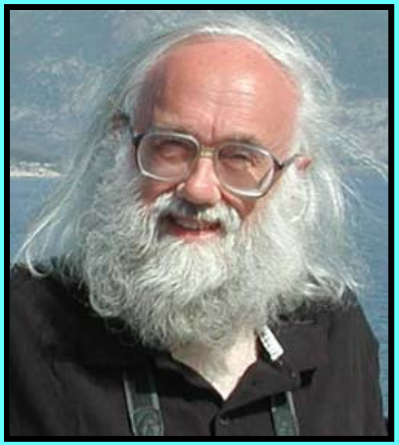
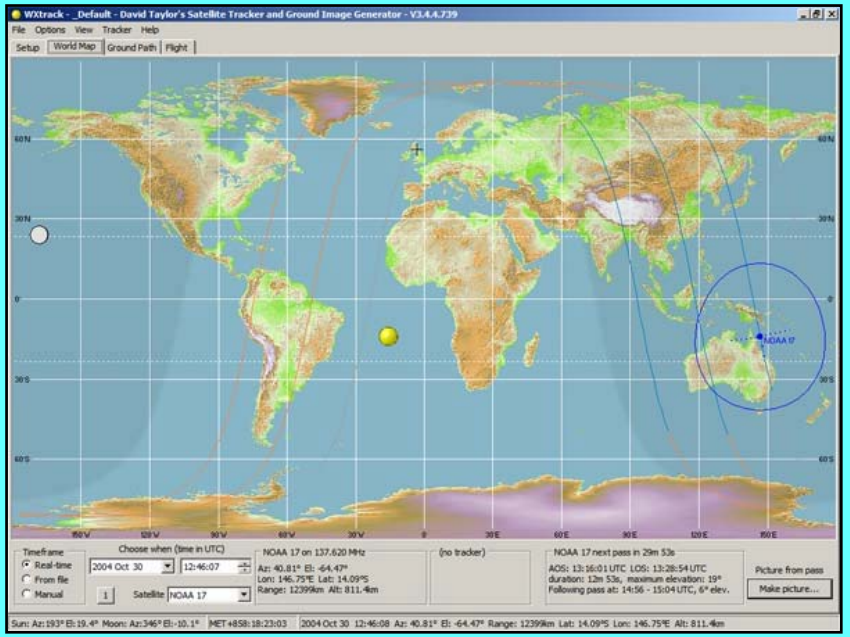
Professional Consultant



GEO is fortunate to be able to call upon renowned software author David Taylor as a consultant.

David's experience is a great asset to our Group



Membership

Although based in the UK, GEO currently has an international membership of over 500, encompassing more than 30 countries

30% of GEO members live outside the UK

What do GEO Members do?

- Most GEO members download weather satellite images, in real time, from Polar Orbiting and Geostationary weather satellites
- GEO members have a collective fascination for all forms of Earth imaging
- Many GEO members are experienced in the use of software to enhance received images

What do GEO Members do?

- Some GEO members design receivers, antennas and other associated hardware
- GEO members help each other by offering advice and sharing experiences
- GEO members strive to advance their hobby by pushing back the frontiers of what is currently considered possible

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GEO Collaborates with the Talented Dutch Group 'Werkgroup Kunstmanen'

Who can Join GEO?

GEO Membership is open to any ***amateur*** enthusiast with an interest in the Earth, Earth imaging, weather satellites and weather phenomena in general

It is one of GEO's prime aims to target the ***education*** sector and to encourage young people everywhere to take an interest in the well-being of our planet

What are the Benefits of Membership?

- 4 issues of ***The GEO Quarterly***, our colour magazine, annually (see examples on our stand)
- The opportunity to attend an annual Symposium at the National Space Centre, Leicester, England
- Sharing experiences with like-minded friends
- Exchanging knowledge with similar user groups in other countries

What Does GEO do for its Members?

- GEO represents the interests of its members with *EUMETSAT*, the European Organisation for the Exploitation of Meteorological Satellites
- GEO also represents its British members with the UK Met Office
- GEO's policy is to liaise with all appropriate Agencies for the ultimate benefit of its membership as a whole

Leicester Symposium - May 2004

Live Meteosat-8 reception

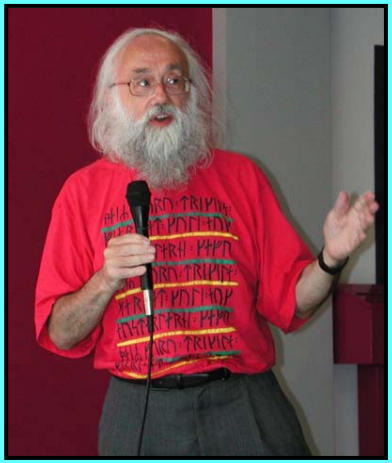
Leicester Symposium - May 2004

Leicester Symposium - May 2004

Discussing antenna construction

GEO Visits 'Werkgroep Kunstmanen'

in Utrecht, Holland (September 2004)



Member's Achievements

GEO numbers among its membership many individuals who have enthusiastically pioneered weather satellite imaging since the days before the personal computer arrived on the scene

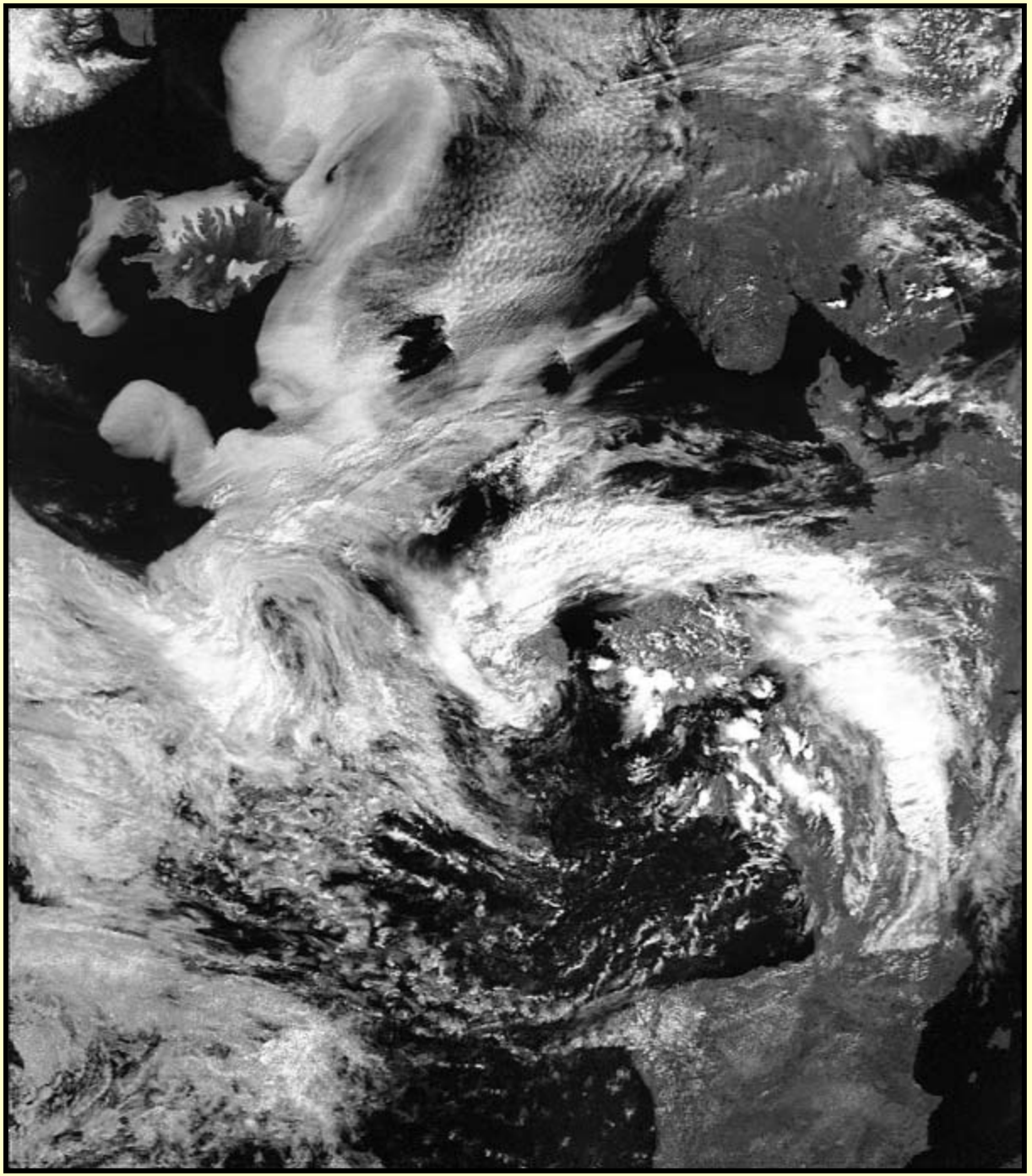
<u>Satellites involved have included</u>

- APT from the early NOAAs
- APT from the now defunct Russian Meteor series
- Meteosat 1.7 GHz Wefax and Primary Data services
- NOAA HRPT reception
- Meteosat Second Generation (MSG) reception

NOAA APT Imaging

NOAA-17
channel-2
APT image

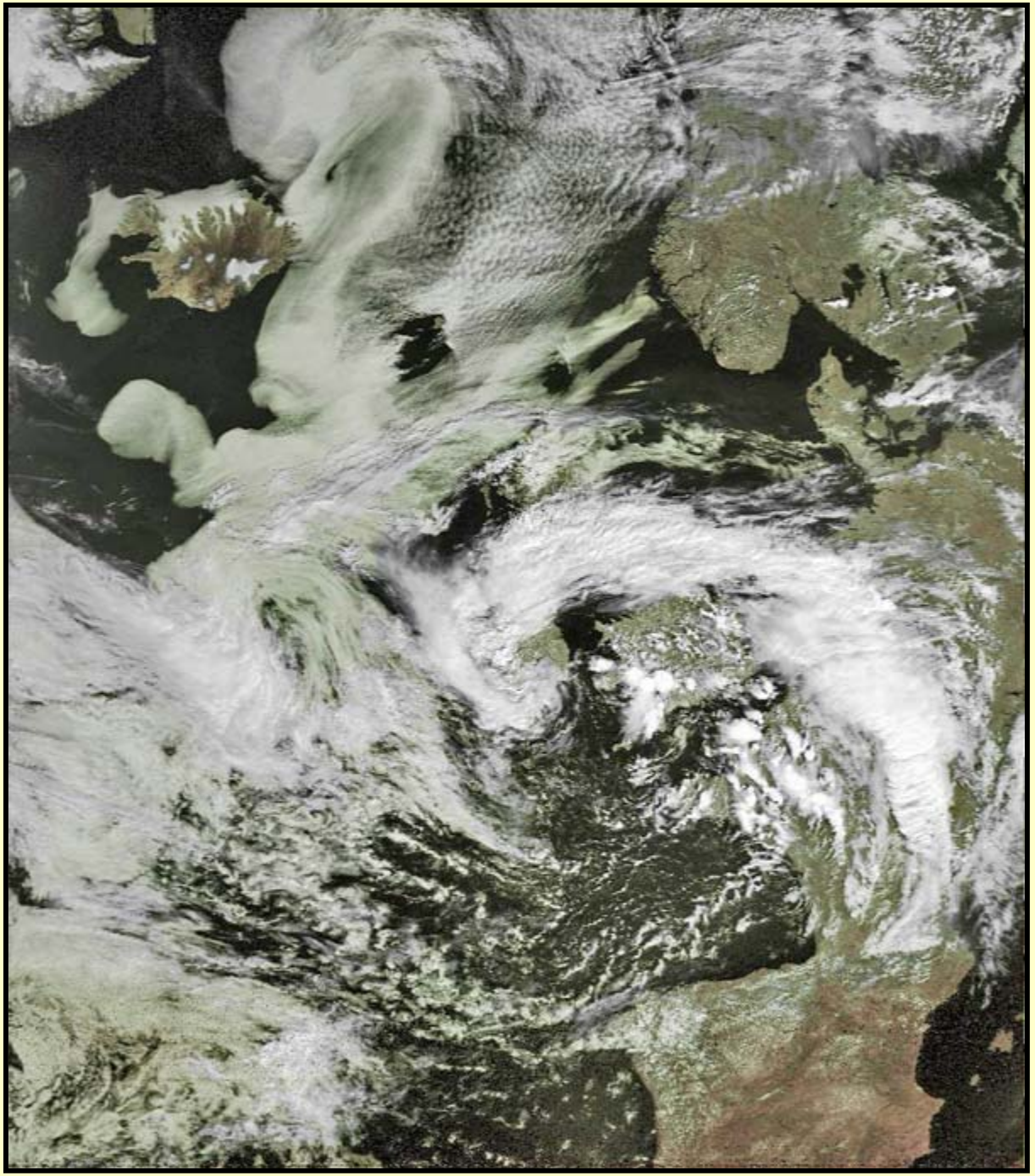
11:24 UT August
12, 2004



NOAA APT Imaging

This is the same image, this time as a channel 2+4 colour composite.

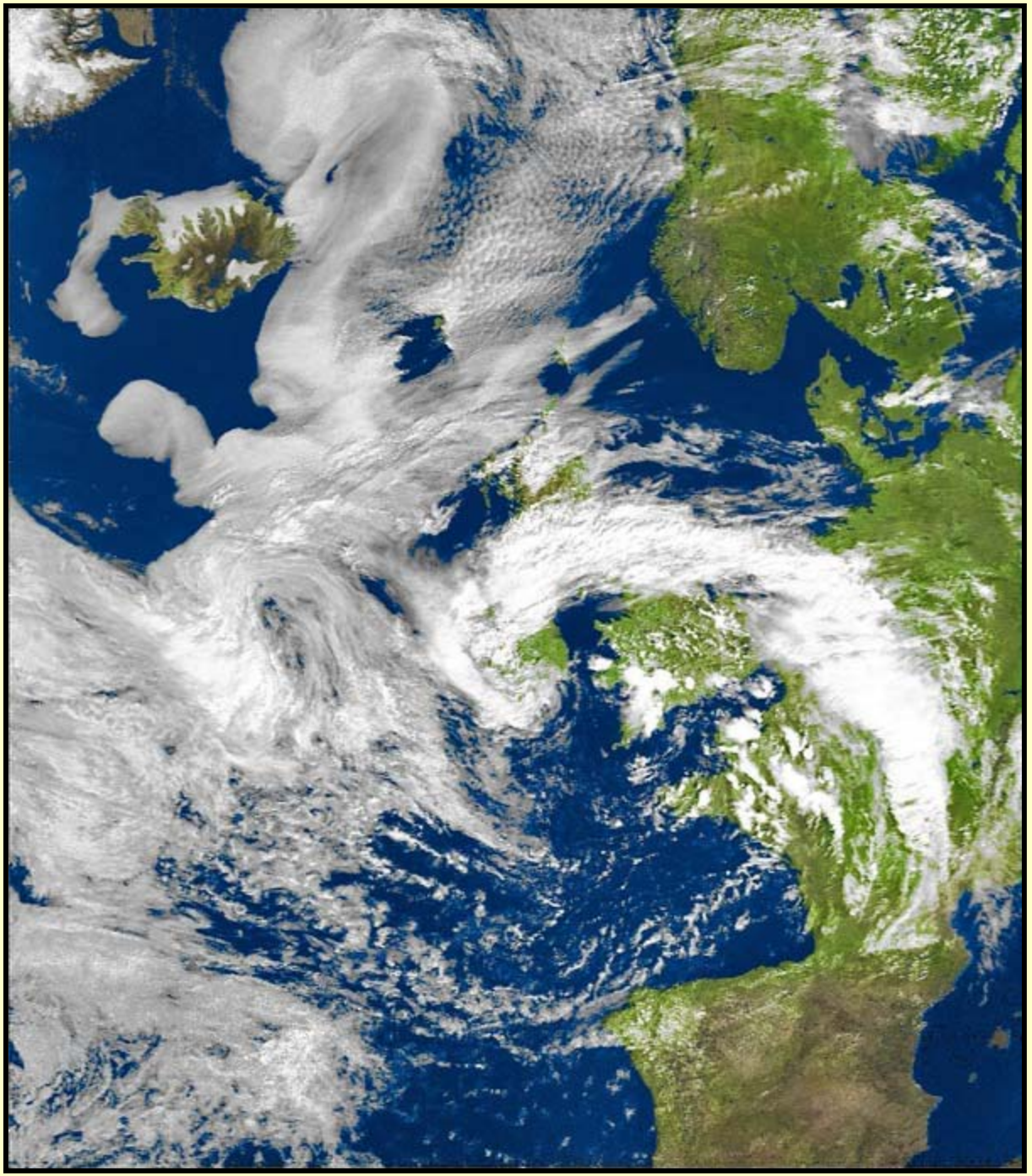
It was created using David Taylor's renowned ***SatSignal*** software.



NOAA APT Imaging

The same image, again as a channel 2+4 colour composite.

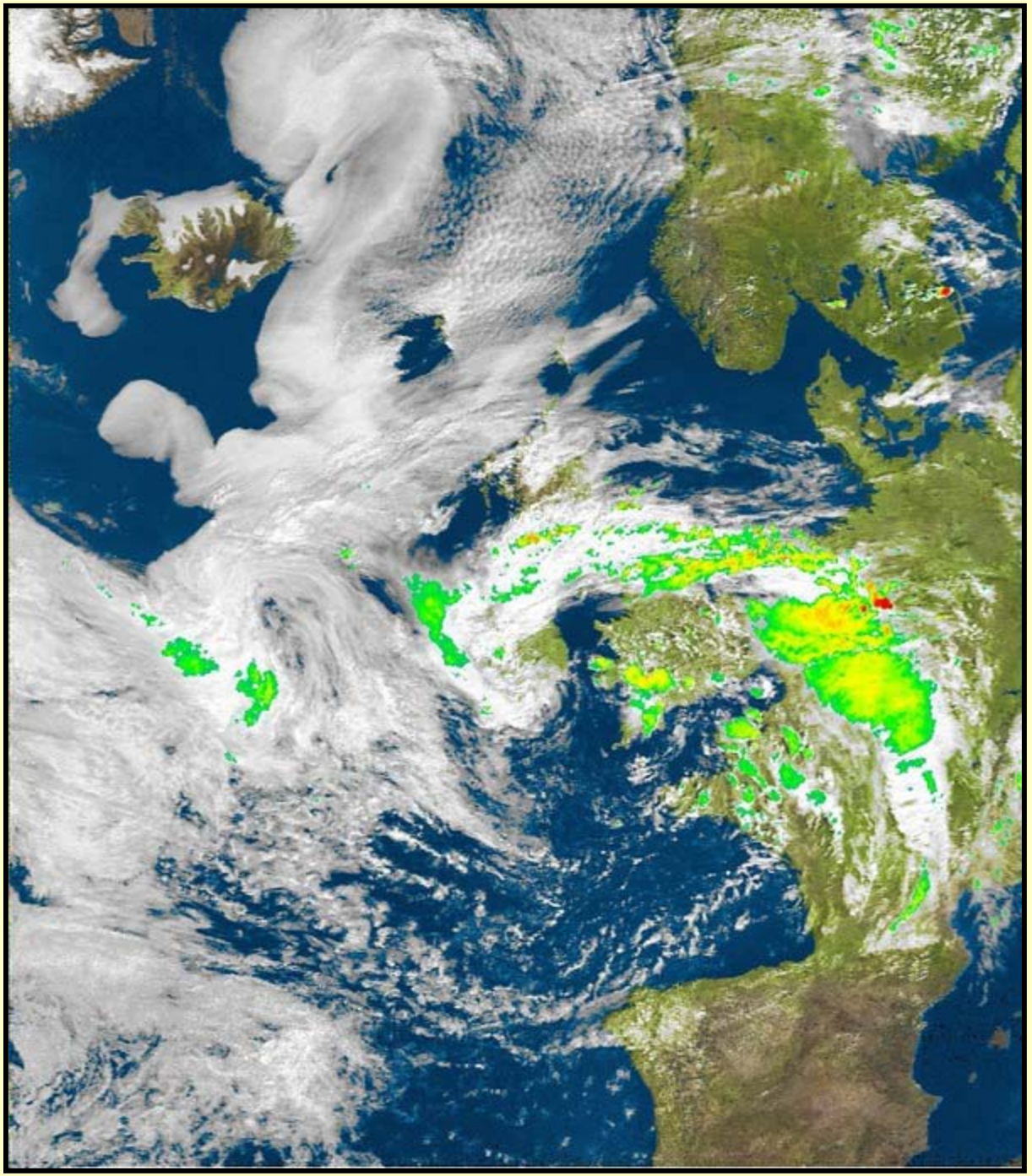
This time, it was created using Craig Anderson's ***WXtoImg*** software.



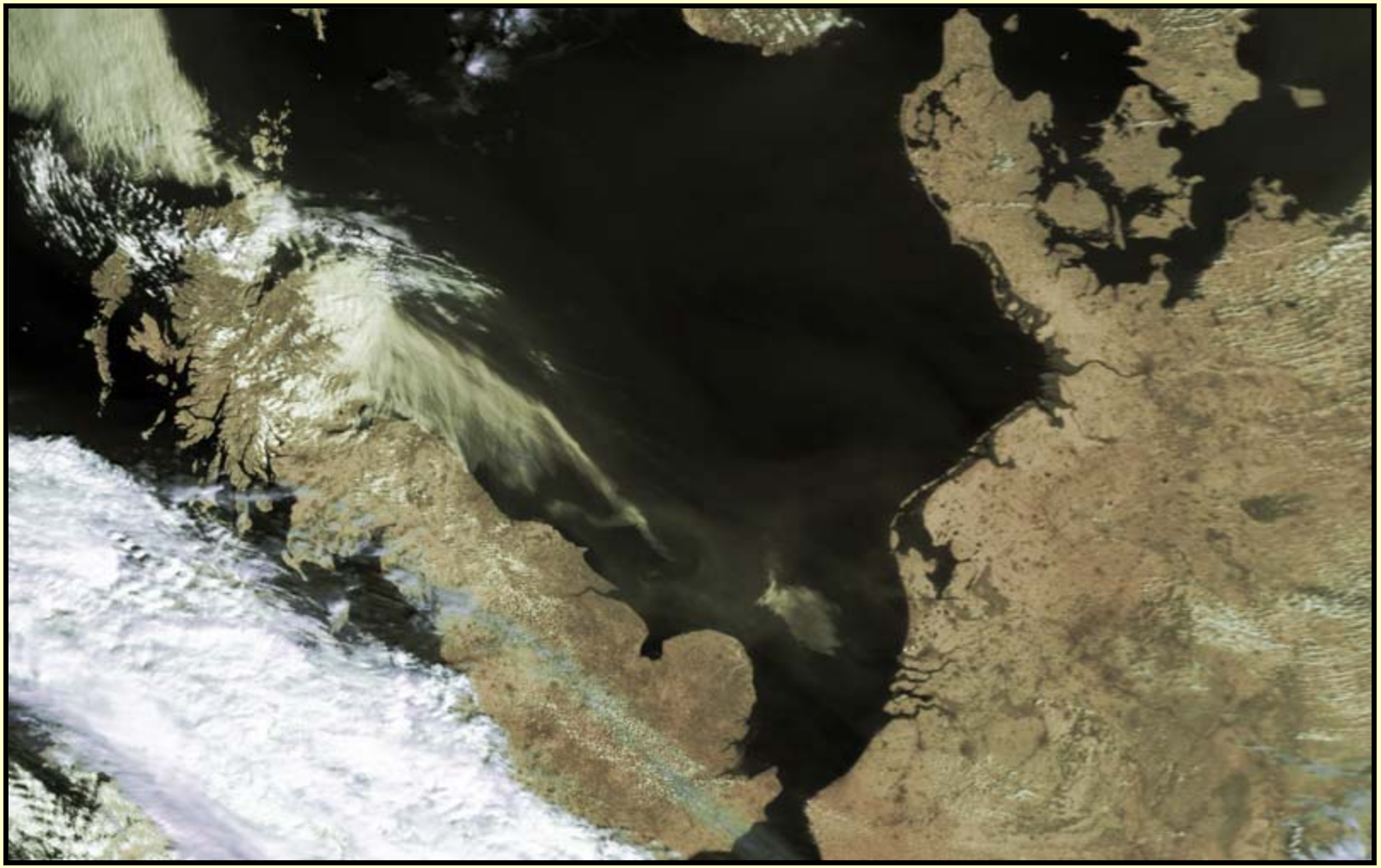
NOAA APT Imaging

The same image again, now adding an algorithm which highlights regions of **rainfall** in colours

It was created using Craig Anderson's ***WXtoImg*** software.



NOAA HRPT Imaging

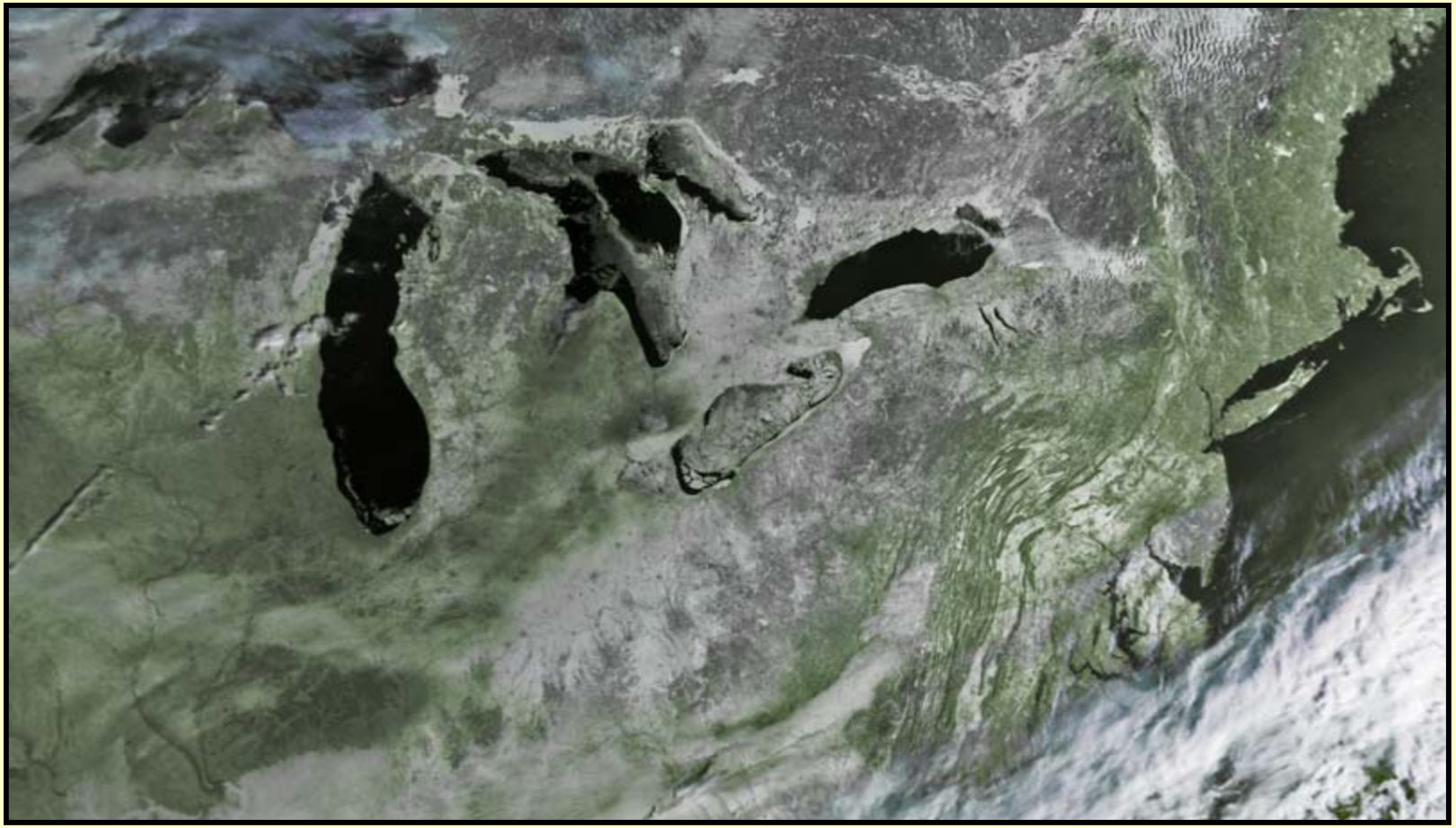


NOAA-17 HRPT, 11:24 UT on August 8, 2004

Processed using David Taylor's ***HRPT Reader*** software

Feng Yun 1D C/HRPT Imaging

An image from one of our US members, Bill Johnston, who lives in New Mexico



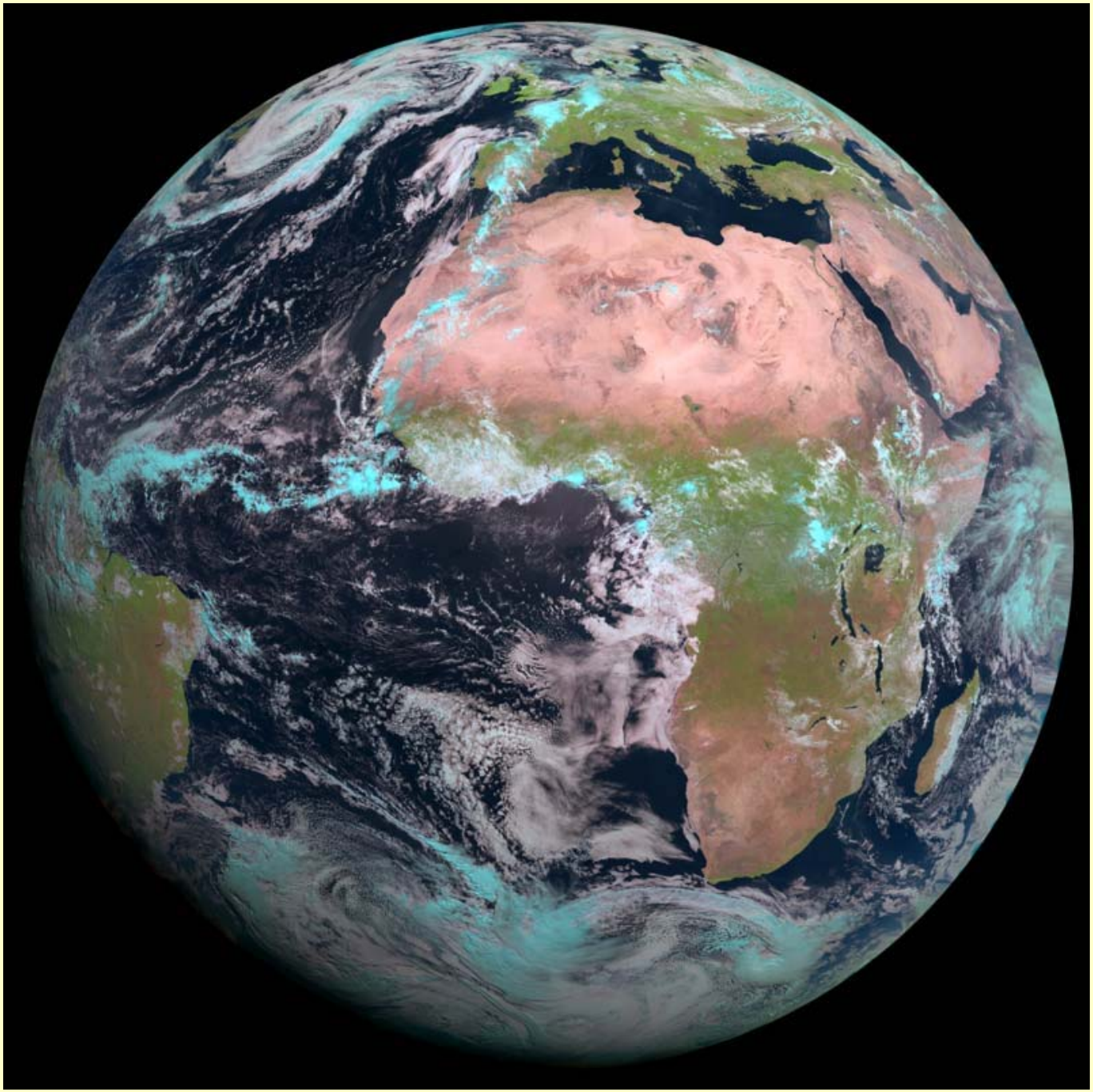
Feng Yun 1D on February 20, 2003 showing thick ice on Lake Erie

Meteosat-8

Full Earth colour composite image prepared using David Taylor's ***GeoSatSignal*** software.

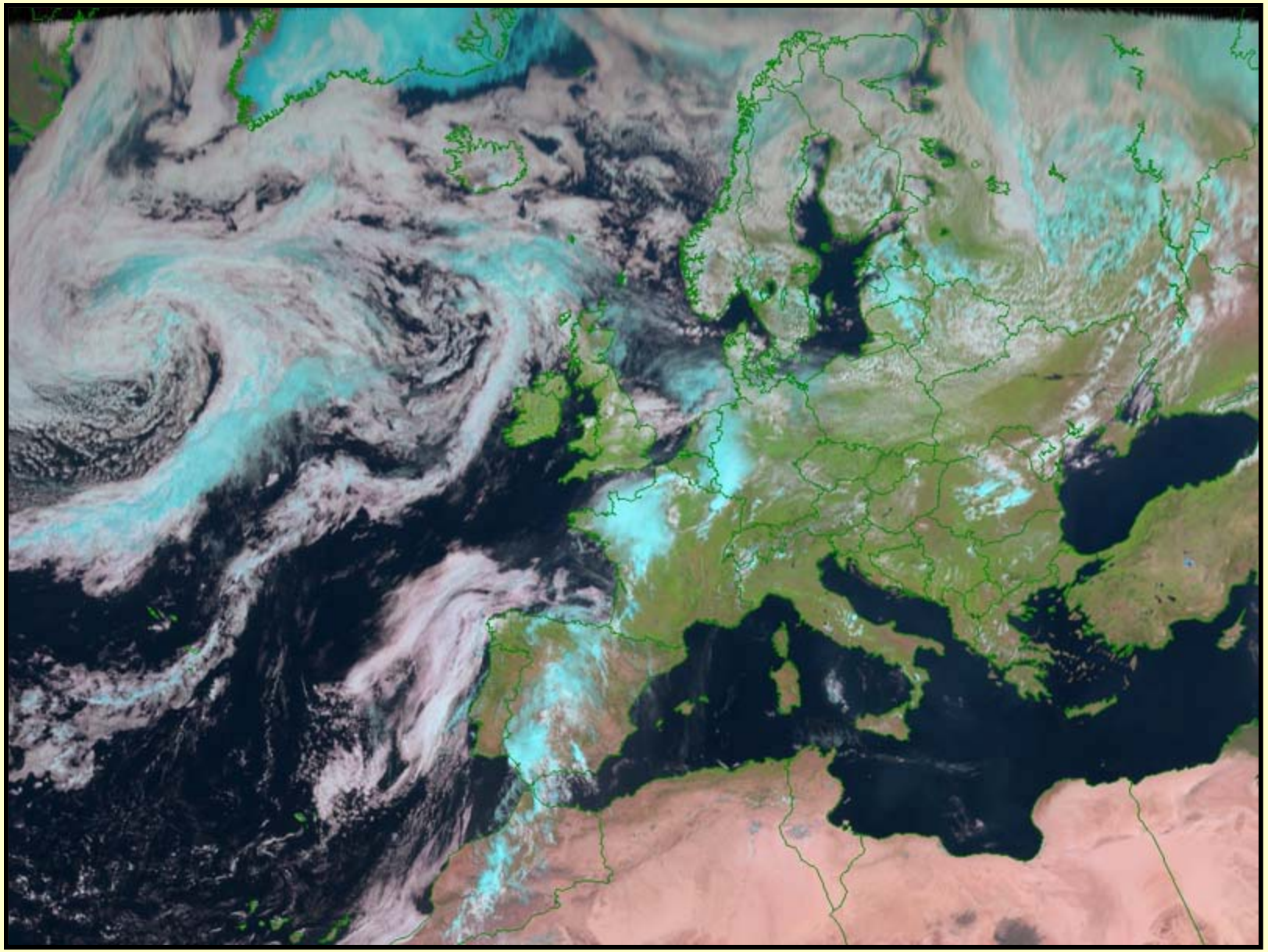
The colouring algorithm used was:
channel-3 (red)
channel-2 (green)
channel-1 (blue)

June 14, 2003

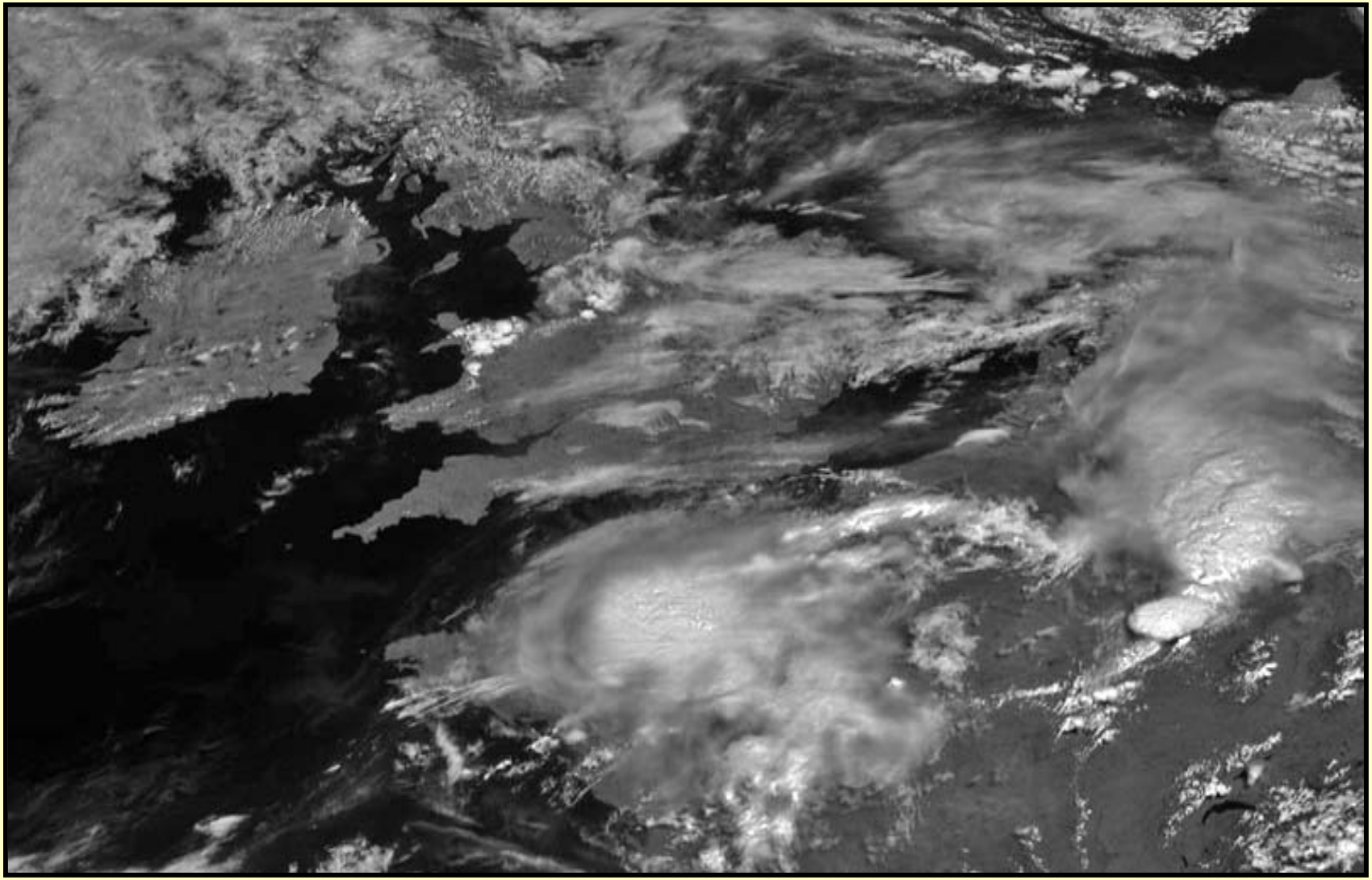


Meteosat-8

This is part of the same image, shown at its full resolution of 2.5 km/pixel



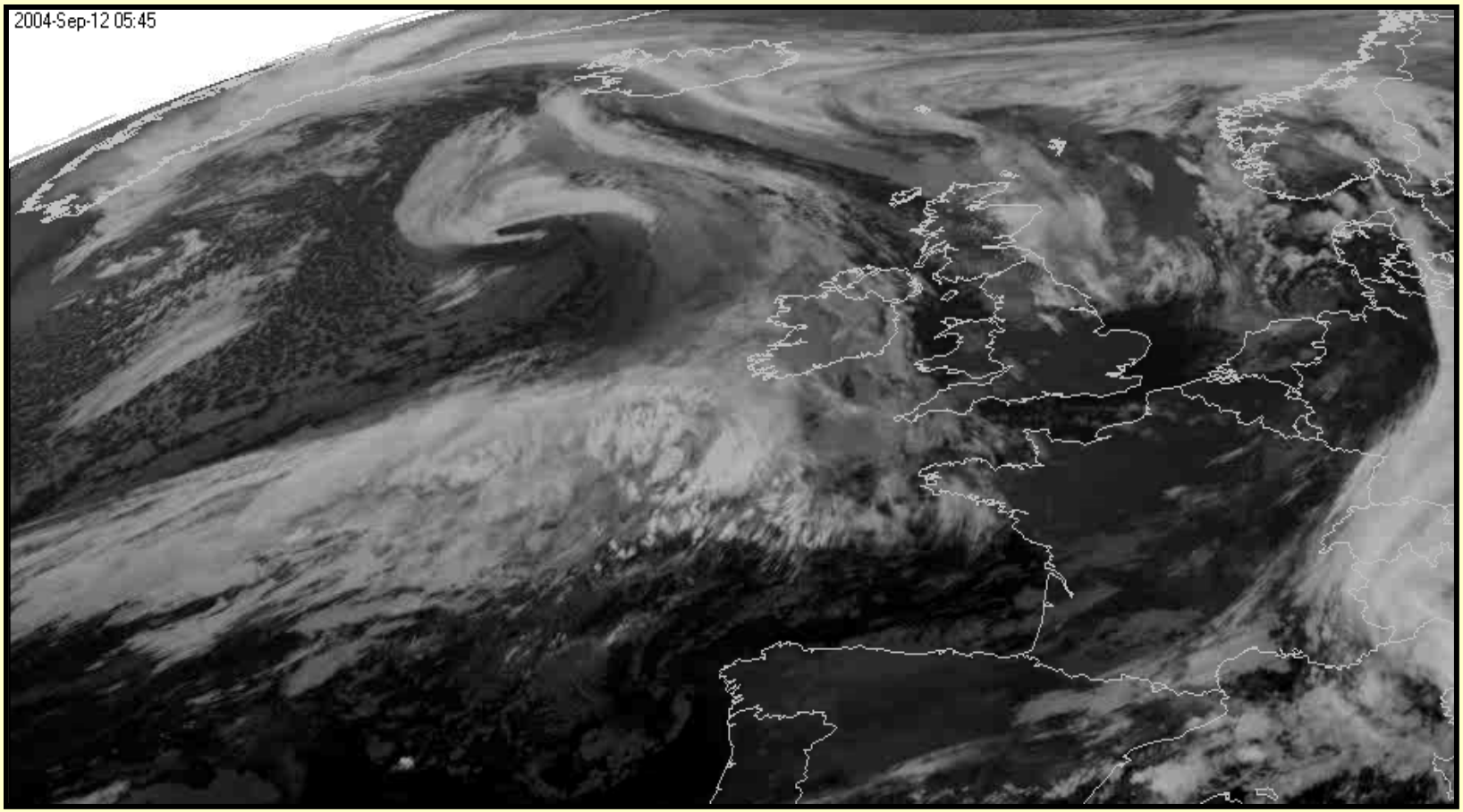
Meteosat-8



This is part of the HRV frame which has a resolution of 1 km/pixel

June 14, 2003

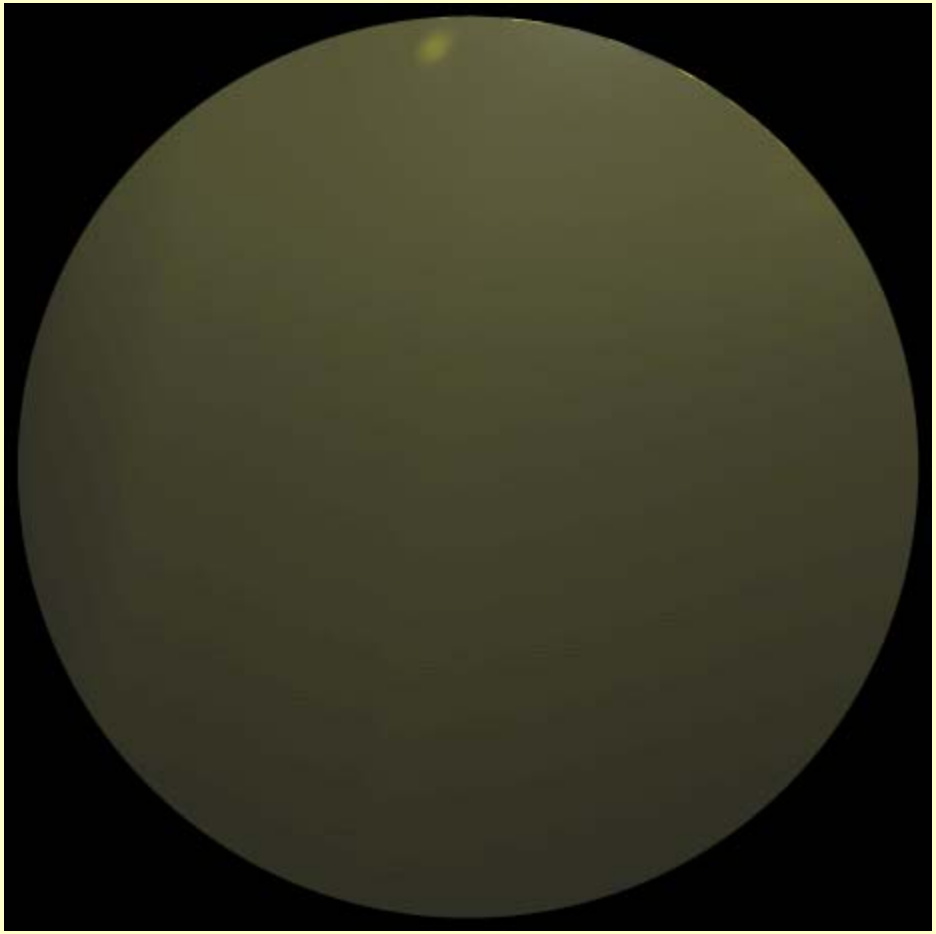
Meteosat Second Generation



Meteosat-8 LRIT ***animation***, September 12, 2004

Created using David Taylor's ***MSG Animator*** program.

Meteosat Second Generation



Meteosat-8 LRIT ***animation***, August 26, 2004

Created using David Taylor's ***GeoSatSignal*** program.

The Future

GEO plans to:

- Continue to monitor what is possible for direct users of Earth imaging satellites
- Explore educational applications and opportunities
- Enjoy the technical challenges

Above all, our ultimate aim must be:

to care for, and have an awareness about, our Sapphire and Emerald planet

Though we are an **amateur** group, we should always remember that one gentleman who described himself as an amateur received, three years later, the ***Nobel Prize*** for physics!

That's All Folks